ORIGINAL

BEFORE THE FLORIDA
PUBLIC SERVICE COMMISSION

DOCKET NO. 07_____-EI
FLORIDA POWER & LIGHT COMPANY

IN RE: FLORIDA POWER & LIGHT COMPANY'S PETITION TO DETERMINE NEED FOR FPL GLADES POWER PARK UNITS 1 AND 2 ELECTRICAL POWER PLANT

CMP _____
COM 5
CTR Org
ECR _____
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DIRECT TESTIMONY & EXHIBIT OF:

GERARD YUPP

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

FLORIDA POWER & LIGHT COMPANY

DIRECT TESTIMONY OF GERARD YUPP

DOCKET NO. 07____ EI

JANUARY 29, 2007

Q. Please state your name and business address.

A. My name is Gerard J Yupp. My business address is 700 Universe Boulevard, Juno Beach, Florida 33408.

Q. By whom are you employed and what is your position?

A. I am employed by Florida Power & Light Company (FPL) as Director of Wholesale Operations in the Energy Marketing and Trading Division.

Q. Please describe your duties and responsibilities in that position.

A. I am responsible for managing the daily activities of the Wholesale Operations Group. Daily activities include natural gas and fuel oil procurement and fuel management among plants for FPL's oil and/or natural gas burning plants, coordination of plant outages with wholesale power needs, real-time power trading, short-term power trading, transmission procurement and scheduling. Longer-term initiatives include fuel planning and evaluating opportunities within the wholesale power markets based on forward market conditions, FPL's outage schedule, fuel prices and transmission availability.

Q. Please describe your educational background and professional experience.

A. I graduated from Drexel University with a Bachelor of Science Degree in Electrical Engineering in 1989. I joined the Protection and Control Department of FPL in 1989 as a Field Engineer and worked in the area of relay engineering. While employed by FPL, I earned a Master of Business Administration degree from Florida Atlantic University in 1994. In May of 1995, I joined Cytec Industries as a plant electrical engineer where I worked until October of 1996. At that time, I rejoined FPL as a real-time power trader in the Energy Marketing and Trading Division. Since rejoining FPL in 1996, I have moved from real-time trading to short-term power trading, power trading manager and assumed my current position in December, 2004.

Q. Are you sponsoring any sections of the Need Study document?

A. Yes. I am sponsoring Sections V.A.2.a., V.A.2.b. , V.A.2.c. (Parts i, ii, v and vi) and V.A.4.a.ii and I co-sponsor Appendix E of the Need Study.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to present and explain: (1) the benefits of fuel diversity in FPL's system resulting from the addition of two 980 MW solid fuel units, including the benefits of on-site fuel inventory; (2) the inherent uncertainty in oil and natural gas price forecasts which necessitates the use of scenario analysis in the long-term economic evaluation of FPL Glades Power Park (FGPP); (3) the methodology for the multiple oil and natural gas price forecasts used by Dr. Sim in FPL's economic evaluation of FGPP; (4) the projected price differential between the delivered price of natural gas to the FPL system and the

delivered price of solid fuel (coal and petroleum coke) to FGPP; and (5) the estimated costs of building and operating fuel inventory capability for a 1,960 MW gas fired generating plant that would be equivalent to the 60-day inventory capability of FGPP.

Q. What are the benefits of maintaining fuel diversity in FPL's system?

A. The primary benefits of maintaining fuel diversity are greater system reliability and reduced fuel price volatility. An electric system that relies on a single fuel to generate all the electricity needed to meet its customers' demand, all else being equal, is less reliable than a system that uses a more balanced, fuel-diverse generation portfolio. In addition, greater fuel diversity mitigates the impact of sudden swings in the price of any one fuel, a phenomenon that has characterized the oil and natural gas market over the last several years.

Q. Please explain how fuel diversity enhances system reliability.

A. An electric system that relies exclusively on one fuel is more susceptible to events that cause delays or interruptions in the production and delivery of that fuel. For example, in 2005 a significant number of natural gas production facilities in the Gulf of Mexico were shutdown as a result of hurricanes. FPL was forced to manage its system fuel requirements with much lower than normal natural gas volumes. Although these supply disruptions presented many challenges to FPL in the area of fuel management, FPL continued to produce sufficient energy to meet its customers' demand for electricity. In part, this was attributable to FPL's fuel-diverse system (in 2005: 42% natural gas, 17% fuel oil, 19% nuclear, 18% coal, and 4% from other sources). Because FPL's system

offers a significant amount of flexibility through its diverse fuel mix and storage capability, FPL was able to continue to meet its customers' demand for electricity with alternate fuel sources until natural gas production was restored. Had FPL's system relied to a substantially greater extent on natural gas to produce electricity, there would have been a greater risk of failing to meet customers' requirements.

Q. Does FPL believe that future additions of natural gas-fired generation will require changes to the current natural gas infrastructure serving Florida?

A. Yes. The existing natural gas pipeline infrastructure into peninsular Florida is comprised of two pipelines from the Gulf Coast region. While this infrastructure has provided a high level of reliability over the years, the demands on both pipelines have continued to grow. In fact, by mid-2009, these pipelines will be fully subscribed. Therefore, the addition of incremental natural gas-fired generation will require an expansion of one or both pipelines into Florida. Even with expansion of the existing pipelines to meet additional demand, the need to consider alternatives that will help promote the diversity of natural gas supply will become imperative. As described above, natural gas production curtailments as a result of 2005 hurricanes, limited the amount of natural gas available to Florida for a period of time. Simply expanding the existing infrastructure will not help reduce this vulnerability. Therefore, as more natural gas-fueled generation increases demand, the need to consider alternatives to maintain reliability will also become imperative. These alternatives could include the addition of a new interstate pipeline, additional underground natural

gas storage, on-site Liquefied Natural Gas (LNG) storage facilities, and identifying alternate supply sources, including access to new producing regions as well as the addition of LNG supply. LNG imports are projected to increase to meet U.S. natural gas demand growth from approximately 1.6 BCF per day in 2006 to approximately 14.3 BCF per day by 2020. By 2020, LNG supply is projected to account for approximately 20% of total U.S. natural gas supply. Although LNG supply is projected to play an essential role in helping meet U.S. natural gas demand growth, it is important to note that as LNG's percentage of total U.S. natural gas supply increases, the risks associated with foreign supply fuel sources will become more prevalent in the overall U.S. natural gas picture. FPL has recognized the need to implement alternative strategies even in today's environment. In an effort to create supply diversity and help strengthen reliability, FPL recently contracted for additional natural gas storage and firm transportation on a new pipeline that will bring on-shore natural gas supply from East Texas into the Mobile Bay area in the Gulf of Mexico. While both projects will help strengthen reliability by helping mitigate FPL's exposure to supply disruptions, the new pipeline will also provide long-term supply diversity. The cost of implementing these strategies will vary depending on the type of alternative being considered. However, it is important to recognize that this investment will have to be made in order to maintain today's level of natural gas reliability in the future as demand for natural gas grows.

Q. Please explain how fuel diversity reduces price volatility.

A. Fuel diversity helps to mitigate the impact of price increases in one or two fuels on the total system cost of fuel. Natural gas and oil have experienced extreme price increases over the past several years. As indicated in Mr. Seth Schwartz's testimony, oil and natural gas prices are historically much more volatile than coal prices. The increase in natural gas prices since 1992 has been three times the increase in coal prices over the same period (and up to nine times the increase at the peak of natural gas prices in 2005). To the extent that multiple fuels are used to produce electricity, the impact of price increases in any one fuel is lessened when that particular fuel does not make up a significant percentage of the total fuel mix. Stated another way, a more balanced fuel portfolio will result in less volatile total fuel costs. Although it is impossible to predict future fuel prices with certainty, based on current fuel price forecasts, the exclusive addition of natural gas-fueled generation in the future would likely result in more volatile and higher fuel costs over time.

Q. Does the addition of FGPP with on-site fuel inventory enhance the reliability of the FPL system compared with a natural gas-fired plant?

A. Yes. FGPP will be able to store up to 60 days of solid fuel (coal and petroleum coke) at the plant site. This equates to approximately 1,000,000 tons or 24,640,000 MMBtu of coal and petroleum coke available for consumption regardless if FPL were to experience a curtailment in the solid fuel supply chain for example, as a result of rail transportation disruption, labor disputes or hurricanes. The capital cost and corresponding operation and maintenance

expenses, and working capital for this coal and petroleum coke storage infrastructure is included in the economic evaluation of FGPP. In comparison, a natural gas-fired plant will generally have three days of back-up fuel oil storage on-site. Therefore, a natural gas-fired plant is more susceptible to interruptions from fuel supply problems such as supply or pipeline curtailments.

Q. Please identify the key factors that contribute to uncertainty in forecasting the price of oil and natural gas.

A. Projections for future prices of oil and natural gas are inherently uncertain due to a significant number of unpredictable and uncontrollable drivers that influence the short- and long-term price of oil and natural gas. These drivers include: (1) current and projected worldwide demand for crude oil and petroleum products; (2) current and projected worldwide refinery capacity/production; (3) expected worldwide economic growth; (4) non-OPEC production and expected growth in non-OPEC production; (5) OPEC production and the availability of spare OPEC production capacity and the assumed growth in spare OPEC production capacity; (6) the geopolitics of the Middle East, West Africa, the Former Soviet Union, Venezuela, etc., as well as, the uncertainty and impact upon worldwide energy consumption related to U. S. and worldwide environmental legislation, politics, etc.; (7) current and projected North American natural gas demand; (8) current and projected U. S., Canadian and Mexican natural gas production; and (9) the worldwide supply and demand for LNG.

Q. Why has FPL developed multiple oil and natural gas price forecasts to support the economic evaluation of FGPP and the Plan without Coal?

A. In the economic evaluation for FGPP, a solid fuel burning plant, the Plan without Coal was based on units which burned natural gas. In this economic evaluation, variations in natural gas price forecasts would impact the differential between natural gas and solid fuel prices and therefore impact the potential fuel savings from FGPP compared with the Plan without Coal. The inherent uncertainty and unpredictability in the factors that affect natural gas prices today, tomorrow, and in the future life of FGPP, clearly underscores the need to develop a set of plausible oil and natural gas price scenarios that will bound the reasonable set of long-term price outcomes for economic evaluation purposes.

Accordingly, to support the economic valuation of FGPP and the Plan without Coal, FPL developed several fuel price forecasts. These forecasts are referred to as: the Medium, Low, High and Shocked Medium price forecasts, all of which are described in detail below.

Q. Did FPL develop several oil and natural gas price forecasts to support the economic evaluation in FPL's most recent Need Determination for the West County Energy Center (WCEC)?

A. No. In FPL's most recent Need Determination filing for WCEC, the primary fuel for all of the alternate projects evaluated, as well as for FPL's self-build project (WCEC), was natural gas. Accordingly, the economic evaluation of all projects assumed the same natural gas price forecast using the same forecast

methodology in the Medium price forecast which is described in detail below. Variations in natural gas price forecasts would therefore impact each alternative and FPL's self-build project equally.

Q. What is the methodology for the development of FPL's Medium price forecast for oil and natural gas?

A. FPL's Medium price forecast methodology, used in FPL's economic evaluation of FGPP and alternative expansion plan, is consistent for oil and natural gas. For oil and natural gas commodity prices, FPL's Medium price forecast applies the following methodology: (1) for 2006 through 2008, the methodology used the October 3, 2006 forward curve for New York Harbor one % sulfur heavy oil, U. S. Gulf Coast one % sulfur heavy oil and Henry Hub natural gas commodity prices; (2) for the next two years (2009 and 2010), FPL used a 50/50 blend of the October 3, 2006 forward curve and monthly projections from The PIRA Energy; (3) for the 2011 through 2020 period, FPL used the annual projections from the PIRA Energy Group; and (4) for the period beyond 2020, recognizing that prices cannot increase indefinitely and that significantly high prices have created, and will continue to create, technological and economic opportunities for commodity substitution in the energy markets, FPL applied the annual rate of increase in the delivered price of solid fuel to the commodity cost of oil and natural gas. In addition to the development of commodity prices, price forecasts also were prepared for oil and natural gas transportation costs. The addition of commodity and transportation projections resulted in delivered price forecasts. These

delivered price forecasts were used in the economic evaluation of FGPP and the Plan without Coal.

Q. What is the methodology for the development of the alternative oil and natural gas price forecasts used in the economic evaluation of FGPP and the Plan without Coal?

A. The development of FPL's Low and High price forecasts for oil, natural gas, coal, and petroleum coke prices were based upon the historical relationship of prices realized by FPL's customers when compared to the average for the same 2000 through 2005 timeframe. For example, the 2000 through 2005 average natural gas price delivered to FPL's system was $6.45/MMBtu. The high price range was $9.34/MMBtu or 145% of the average and the low price range was $4.20/MMBtu or 65% of the average. These factors were multiplied by the monthly Medium price forecast to determine the Low and High price for each commodity for the duration of the forecast period. This same process was applied to oil, coal and petroleum coke consistently. FPL developed these forecasts to account for the uncertainty that exists within each commodity as well as across commodities. These forecasts align with FPL's actual price variability realized during the 2000 to 2005 period, thus ensuring that the analyses of the two resource plans will reflect a range of reasonable forecast outcomes.

The development of the Shocked Medium (Shocked) price forecast for oil and natural gas was based on the same methodology as described above however;

the increase was applied to only the oil and natural gas prices and is consistently applied through 2016. In 2017, FPL averaged the Medium price forecast with the Shocked price forecast. From 2018 forward, oil and natural gas prices are the same as prices in the Medium price forecast. FPL developed the Shocked price forecast as a sensitivity to show the impact of what a significant price increase in oil and natural gas will have on the value of adding FGPP to FPL's portfolio of assets.

Q. Are FPL's Medium, Low, High, and Shocked price forecasts for oil and natural gas prices reasonable and necessary for the economic evaluation of FGPP and the Plan without Coal?

A. Yes. FPL's long-term oil and natural gas price forecasts are reasonable and necessary for the economic evaluation of FGPP and the Plan without Coal. FPL's fuel price forecasts identify a reasonable set of forecast outcomes based on an actual historical range of prices realized by FPL's customers during the 2000 through 2005 period, a period of time that experienced high variability among commodity prices, unprecedented price volatility on a domestic and worldwide basis, and a period of low and high price differentials between commodities.

Q. Have you provided FPL's forecasts for the price of oil and natural gas?

A. Yes. FPL's forecasts for the price of oil and natural gas are provided in Appendix E of the Need Study document.

Q. What is the projected price differential between the delivered price of natural gas to the FPL system and the delivered price of solid fuel to FGPP?

A. The projected price differential between the delivered price of natural gas to the FPL system and the delivered price of solid fuel to FGPP is a major driver in the economic evaluation of FGPP and the Plan without Coal. The four delivered price forecasts for natural gas to the FPL system, as shown in Appendix E of the Need Study document less the corresponding forecasts for the delivered price of solid fuel to FGPP, as discussed in Mr. Schwartz's testimony, result in four projected price differential forecasts between natural gas and solid fuel. These price differential forecasts are shown in Appendix E of the Need Study document. The economic evaluation of FGPP and the Plan without Coal provides a range of potential cost outcomes given the potential price differential scenarios. Although periods of lower natural gas prices will reduce the fuel cost benefits to FPL's customers specifically from the addition of FGPP, periods of lower gas prices will at the same time benefit FPL's customers due to the significant level of natural gas generation in the FPL system.

Q. Will future environmental regulations be a key determinant of the price differential between natural gas and solid fuel?

A. Yes. Future environmental regulations will be a key determinant of the price differential between natural gas and solid fuel. As varying degrees of environmental regulations impact the demand for natural gas and solid fuel, the price differential between the fuels will be impacted. While it is difficult to quantify how environmental regulations will impact this price differential, as

there are many variables to consider, certain intuitive assumptions can be made to help better define the trend of this differential under varying degrees of environmental regulation. In particular, if future environmental regulations were to impose high compliance costs on solid fuel generating plants as opposed to natural gas-fueled plants, the demand for natural gas would most likely increase as natural gas-fueled generation would become preferable from an economic standpoint. Conversely, in this scenario, the demand for solid fuel would likely decrease. In general, an increase in demand for natural gas and decrease in demand for solid fuel should result in a widening of the price differential between natural gas and solid fuel. Therefore, although possible, we would not expect to see a narrowing of the price differential between natural gas and solid fuel as environmental compliance costs on solid fuel generation increase.

Q. Has FPL estimated the cost of building and operating fuel inventory capability for a 1,960 MW gas-fired generating plant that would be equivalent to the 60-day inventory capability of FGPP?

A. Yes. FPL estimated the cost of providing equivalent fuel inventory capability using LNG and light fuel oil. FPL did not consider on-site natural gas storage mainly due to the lack of economically viable geological formations to develop natural gas storage in Florida. The only way to replicate this type of reliability for natural gas would be to build a comparable on-site LNG storage facility which would include liquefaction, storage and regasification. The Cumulative Present Value of Revenue Requirements (CPVRR) to build, operate and maintain this type of comparable LNG storage facility, including working

capital, would be approximately $1.42 billion. Another on-site storage alternative is to build, operate and maintain light oil storage and gain air permitting approval from the Department of Energy (DOE) to burn light oil beyond 500 hours per year. The CPVRR to build, operate and maintain this light oil infrastructure, including working capital, would be approximately $0.41 billion for a 3.7 million barrel tank farm, which would consist of 8-500,000 barrel tanks. Furthermore, assuming inventory turnover once per year with an additional light oil cost of approximately $6.00 per MMBtu higher than that of natural gas, the total CPVRR for comparable light oil storage would be $1.50 billion compared to a Plan without Coal.

Q. Will FGPP reduce FPL's reliance on natural gas and fuel oil for electric generation?

A. Yes. FGPP will greatly reduce FPL's reliance on natural gas and fuel oil compared to the Plan without Coal. The operation of FGPP will displace approximately 100 BCF of natural gas consumption per year. Stated another way, during its first 20 years of operation, FGPP will displace and prevent the need for the consumption of as much natural gas as FPL's system consumed in the six year period from 2001 through 2006.

Q. Please summarize your testimony.

A. Maintaining fuel diversity in FPL's generation portfolio will enhance reliability and reduce fuel price volatility. First, a fuel-diverse system is more reliable than one that is dependent on a single fuel source. As described in this testimony, a system that maintains a balanced fuel portfolio is able to withstand delays or

interruptions in the delivery of any one particular fuel, as evidenced by FPL's ability to withstand severe natural gas production curtailments during the 2005 hurricane season. Furthermore, FPL will be able to store up to 60 days of solid fuel at the plant site, an option that a traditional analysis of a natural gas-fired plant does not include. Second, a fuel-diverse system will help reduce fuel price volatility as the susceptibility to severe price swings in any one fuel type is mitigated in a more balanced fuel portfolio.

FPL developed multiple oil and natural gas price forecasts to address the variability among fuels over time in the economic evaluation of FGPP because projections for future prices of oil and natural gas are inherently uncertain due to a significant number of unpredictable and uncontrollable drivers that influence the short and long-term price of oil and natural gas. FPL's multiple oil and natural gas price scenarios define a reasonable set of long-term price outcomes for economic evaluation purposes.

Q. Does this conclude your testimony?

A. Yes.